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Uri Elzur

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EXAMINER

HOANG, HIEU T

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/652,327	<b>Applicant(s)</b> ELZUR ET AL.	
	<b>Examiner</b> HIEU T. HOANG	<b>Art Unit</b> 2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03/24/2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/03/07</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 03/24/2008 has been entered.
2. Claims 29-31 are new.
3. Claims 1-31 are pending.

### ***Response to Arguments***

4. Applicant's arguments have been fully considered but they are not persuasive.
5. *Argument 1 on claims 1-4, 15-20 and 23 on pages 14-17 of the Remarks.*

Applicant argues that the prior art does not teach “a processor operable to process a plurality of different types of network traffic”. The examiner respectfully disagrees. Consider claim 1, for example, Boucher discloses that a packet is determined to be routed through either a “fast path” when it’s an offload traffic--first type of traffic (fig. 9, col. 6 lines 39-55, TCP/IP processed by the processor on the network interface card (INIC) is offload traffic, meaning TCP processing is offloaded to the INIC instead of being handled by host protocol stack processing) or a “slow path” when it’s regular traffic such as Ethernet, IP traffics (fig. 9, MAC and network layer traffics). And routing determination is based on packet traffic type indicated in the header of the

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packet (col. 6, line 42). Furthermore, the claim does not recite what network traffic types really are. So based on col. 6 line 43 alone, Boucher does teach two different types of traffics TCP/IP and SPX/IPX being supported by the hardware processor on the INIC in fig. 6.

Same rationale applies to argument on claim 24.

**6.**     *Argument 2 on pages 18-19*

7.     Applicant argues on the motivation of combining the prior arts. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it is submitted that all necessary motivation for prior art combination has been provided in the previous Office Action and maintained.

8.     On pages 22, the applicant traversed the Official Notice taken that “employ time division multiplexing (TDM) to transmit multiple traffics over one channel in different timeslots” and “dynamically allocating fixed resources between among the different types of network traffic”. In response, the examiner submits that the Microsoft Computer Dictionary (fifth edition) defines TDM as a form of multiplexing in which transmission time is broken into segments, each of which carries one segment of one signal, reading

on “time division multiplexing (TDM) to transmit multiple traffics over one channel in different timeslots.” “Dynamically allocating fixed resources between among the different types of network traffic”, given its broadest interpretation, means dynamically allotting amount of resource(s) for each type of traffic, which is known to one skilled in the art how to implement (see Yang et al. US 2002/0041566, abstract).

### ***Claim Objections***

9. Claims 29-31 are objected to because of the following informalities: the preambles are indistinguishable from the bodies of the claims. Appropriate correction is required.
10. Claim 29 recites on line 3 “the network services comprises.” This is believed to be a grammatical error. Applicant is required to check for similar errors in the claims.
11. Claims 21 and 22 recite “wherein (c) comprises.” The is no antecedent basis for (c). Correction is required.

### ***Claim Rejections - 35 USC § 101***

12. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
13. Claims 29-31 are rejected under 35 U.S.C. 101 the claimed invention is directed to non-statutory subject matter. A unified driver per se is a software element and is

non-statutory subject matter, since it is not one of a process, machine, manufacture, and composition of matter.

***Claim Rejections - 35 USC § 102***

14. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

15. Claims 1-4, 15-20, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Boucher et al. (US 6,226,680, hereafter Boucher).

16. For claim 1, Boucher discloses a server, comprising:

- a network connector (fig. 13, col. 16 lines 6-12, network line 210, four network lines are presented for different conduits, but each of them is a media independent interface);
- a processor coupled to the network connector (fig. 13, microprocessor 470, col. 16 line 62-col. 17 line 13), the processor being operable to process a plurality of different types of network traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor supports an offload traffic via fast path and regular IP traffic via a slow path);
- a peripheral component interface (PCI) bridge coupled to the processor (fig. 13, PIC bus interface unit); and

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- a unified driver coupled to the PCI bridge, the unified driver being operable to provide drivers associated with the plurality of different types of network traffic (fig. 6 and 10, PCI bridge 157 connected to protocol stack with driver, col. 14 l. 9-13, INIC miniport driver determines whether the traffic is fast path offload traffic and slow path IP traffic).

17. For claim 2, Boucher further discloses the network connector comprises an Ethernet connector (fig. 13, network line 210 is an Ethernet connector).

18. For claim 3, Boucher further discloses the plurality of different types of network traffic comprises two or more of common Ethernet traffic, offload traffic, storage traffic, interprocess communication (IPC) traffic, management traffic and remote direct memory access (RDMA) traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor supports an offload traffic via fast path and regular IP traffic via a slow path, or Ethernet traffic and offload traffic).

19. For claim 4, Boucher further discloses the processor comprises a single integrated chip (fig. 9, fig. 13, microprocessor).

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20. For claim 15, Boucher further discloses the processor or the PCI bridge determines which of the different types of network traffic accesses a particular service provided by the server (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver determines whether the traffic is fast path offload traffic and slow path IP traffic).

21. For claim 16, the claim is rejected for the same rationale as in claim 13.

22. For claim 17, Boucher further discloses the processor, the PCI bridge or the unified driver provides a unified data and control path (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver determines whether the traffic is fast path offload traffic and slow path IP traffic).

23. For claim 18, Boucher discloses a method for network interfacing, comprising:  
handling a plurality of different types of network traffic via a layer 2 (L2) connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller supporting both offload traffic and regular IP traffic);  
processing the different types of network traffic in a single chip (fig. 13, microprocessor 470, col. 16 line 62-col. 17 line 13, col. 3 lines 35-67, the INIC supports an offload traffic via fast path and regular IP traffic via a slow path); and



determining which of the different types of network traffic accesses software services via a single data path (fig. 10 and 11, col. 14 l. 9-13 and 61-66, INIC miniport driver determines whether the traffic is fast path offload traffic and slow path IP traffic, single line connecting INIC and INIC miniport driver).

24. For claim 19, Boucher further discloses the plurality of different types of network traffic comprises two or more of common Ethernet traffic, offload traffic, storage traffic, interprocess communication (IPC) traffic and management traffic (abstract, col. 3 lines 35-67, col. 13 lines 24-35, the intelligent network interface card INIC's processor supports an offload traffic via fast path and regular IP traffic via a slow path, or Ethernet traffic and offload traffic) and/or remote direct memory access (RDMA) traffic.

25. For claim 20, Boucher further discloses the L2 connector is a single L2 connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller, four network lines are presented for different conduits, but each of them is media independent interface).

26. For claim 23, Boucher further discloses: providing drivers associated with the plurality of different types of network traffic via a unified driver (fig. 11 INIC miniport driver for both offload traffic and regular IP traffic).

***Claim Rejections - 35 USC § 103***

27. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

28. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 1 above, and further in view of Kistler et al. (US 2002/0198934, hereafter Kistler)

29. For claims 10 and 11, Boucher discloses the invention as in claim 1. Boucher does not disclose a server management agent coupled to the processor that is coupled to a keyboard and/or video and/or mouse service.

However, Kistler discloses the same (fig. 3 keyboard and mouse connected to an emulator that is coupled to a NIC)

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Kistler to provide console interaction handling over the network (Kistler, abstract)

30. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher as applied to claim 1 above, and further in view of Microsoft (Winsock Direct and Protocol Offload on SANs, 03/03/2001).

31. For claim 14, Boucher does not disclose the unified driver is coupled to a software TCP processor and to a socket service switch, wherein the software TCP processor is coupled to the socket service switch

However, Microsoft discloses the unified driver is coupled to a software TCP processor and to a socket service switch, wherein the software TCP processor is coupled to the socket service switch (Microsoft, fig. 1, a socket switch between a TCP/IP socket provider and a SAN provider), and wherein the socket service switch is coupled to a socket service (Microsoft, fig. 1, switch coupled to socket application).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Microsoft to provide WinSock socket service switch to a TCP/IP-offload-enabled NIC card of Boucher in order to further enhance the card with more functionalities such as RDMA traffic support.

32. For claim 12, Boucher-Microsoft discloses the invention as in claim 14. Boucher-Microsoft further discloses a plurality of services coupled to the unified driver (Microsoft, fig. 1, p. 5 lines 7-8, socket service, RDMA service).

33. For claim 13, Boucher-Microsoft discloses the invention as in claim 14. Boucher-Microsoft further discloses the particular service comprises at least one of a socket service, a SCSI miniport service, an RDMA service and/or a keyboard and/or video and/or mouse service (Microsoft, fig. 1, p. 5 lines 7-8, socket service, RDMA service).

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34. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 18 above, and further in view of Official Notice (hereafter ON).

35. For claim 21, the claim is rejected as in claim 18. Boucher does not disclose (c) comprises employing time division multiplexing to determine which of the different types of network traffic access the software services via the single data path.

However, Official Notice is taken that it is well known in the art how to employ time division multiplexing (TDM) to transmit multiple traffics over one channel in different timeslots. See Microsoft Computer Dictionary (fifth edition) defines time division multiplexing as a form of multiplexing in which transmission time is broken into segments, each of which carries one segment of one signal or traffic.

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and what is well known in the art to send multiple traffic over one channel using TDM in order to minimize cost of buildings multiple channels unnecessarily.

36. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, further in view of Yang et al. (US 2002/0041566, hereafter Yang).

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37. For claim 22, the claim is rejected for the same rationale as in claim 18. Boucher does not disclose dynamically allocating fixed resources among the different types of network traffic.

However, Yang discloses dynamic and fixed resource allocation for TDMA (abstract)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Yang to allocate fixed resources among traffic types to allow optimize the use of resource such as service rate while maintaining quality of services (Yang, [0018])

38. Claims 5-8 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, as applied to claim 1 above, and further in view of Hayes et al. (US 2003/0046330, hereafter Hayes)

39. For claim 5, Boucher further discloses the processor comprises a layer 2 network interface card (L2 NIC) (fig. 13, MAC controller 402), a transmission control protocol (TCP) processor (fig. 9, TCP processor for offload).

Boucher does not disclose an upper layer protocol (ULP) processor;

However, Hayes discloses an upper layer protocol (ULP) processor (fig. 3, [0017], NIC with an auxiliary processor for offloading iSCSI upper layer traffic)

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Hayes to provide ULP support for a TCP/IP offload NIC card in order to further enhance the card with more functionalities such as iSCSI traffic support over TCP/IP.

40. For claim 6, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the TCP processor provides layer 3 processing and layer 4 processing (fig. 9, an offload processor provides L3 IP and L4 TCP offload traffic).

41. For claim 7, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the TCP processor is shared by two or more of TCP offload traffic (fig. 9, an offload processor provides L3 IP and L4 TCP offload traffic), Internet small computer system interface (iSCSI) traffic (Hayes, [0017]) and RDMA traffic.

42. For claim 8, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the ULP processor provides iSCSI processing (Hayes, [0017], [0018]).

43. For claim 24, Boucher discloses a method for network interfacing, comprising:  
handling a plurality of different types of network traffic via a single Ethernet connector (fig. 13, col. 16 lines 6-12, a network line 210 connected to a MAC controller supporting both offload traffic and regular IP traffic);

processing the plurality of different types of network traffic using a layer 2 (L2) processor (fig. 13, L2 MAC controller 402), a layer 3 (L3) processor and a layer 4 (L4) processor (fig. 9 a TCP/IP offload processor that processes L3 and L4 traffics) and providing a unified data and control path (fig. 13 links between processor and PCI bus interface).

Boucher does not disclose an upper layer protocol (ULP) processor;

However, Hayes discloses an upper layer protocol (ULP) processor (fig. 3, [0017], NIC with an auxiliary processor for offloading iSCSI traffic);

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Hayes to provide ULP support for a TCP/IP offload enabled NIC card in order to further enhance the card with more functionalities such as iSCSI traffic support over TCP/IP.

44. For claim 25, the claim is rejected for the same rationale as in claim 20.

45. For claim 26, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes further discloses the L3 processor and the L4 processor are combined into a single TCP processor (fig. 9, TCP offload processor 230 bypasses (L3 IP and L4 TCP) offload traffic to upper layers (application layer...)

46. For claim 27, the claim is rejected for the same rationale as in claim 24.

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47. For claim 28, the claim is rejected for the same rationale as in claim 23.

48. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher-Hayes, as applied to claim 5 above, and further in view of Microsoft.

49. For claim 9, Boucher-Hayes discloses the invention as in claim 5. Boucher-Hayes does not disclose the ULP processor provides RDMA processing

However, Microsoft discloses the same (Microsoft, page 5, Remote DMA semantics including RDMA write and read).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher-Hayes and Microsoft to provide WinSock socket service switch between RDMA and TCP/IP in order to further enhance the card with more functionalities such as RDMA traffic support.

50. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boucher, further in view of Callaghan (NFS over RDMA).

51. For claim 29, Boucher discloses a unified driver for processing network traffic comprising a single software driver to handle a plurality of different types of network traffics (fig. 6 and 10, single network interface card INIC connected to host through a PCI bridge 157, col. 14 l. 9-13, INIC miniport driver on the INIC determines whether the traffic is fast path offload traffic (TCP/IP for instance) and slow path traffic (IP, Ethernet



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traffic) and network services, the network services comprises a storage service (col. 13 lines 42-45, large file transfer service using fast path or SMB over TCP/IP). Boucher also discloses a DMA controller for direct memory access to the host system cache (col. 13 lines 53-58). Boucher does not explicitly disclose a socket service, RDMA service or keyboard/video/mouse service.

However, Callaghan discloses a storage service and a RDMA service (section 2 and 6, network file system service (NFS) and RDMA service using hardware, section 7)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Boucher and Callaghan to implement NFS over RDMA to make full and efficient use of gigabit network (Callaghan, first par.)

52. For claim 30, Boucher-Callaghan further discloses said unified driver couples to an integrated chip to concurrently process a plurality of network traffics (Boucher, fig. 6 and 11, INIC processor and INIC miniport driver on the INIC).

53. For claim 31, Boucher-Callaghan further discloses said plurality of network traffics comprises two or more of offload traffic (Boucher, col. 6 lines 39-55, TCP/IP processed by the processor on the network interface card (INIC) is offload traffic), storage traffic (Boucher, col. 13 lines 42-45, large file transfer service using fast path or SMB over TCP/IP), interprocess communication (IPC) traffic, management traffic and/or remote direct memory access (RDMA) traffic.

***Conclusion***

54. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571-272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Jeffrey Pwu/

Supervisory Patent Examiner, Art Unit 2146